



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No. : 09/884,720
Applicant : Richard R. Hengst
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Commissioner for Patents
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AFFIDAVIT OF RICHARD R. HENGST
PURSUANT TO 37 CFR 1.132

RICHARD R. HENGST, being duly sworn, deposes and says as follows:

1. I am the sole inventor in the above referenced Application and Product Manager of Crystar® Components, a division of the assignee, Saint-Gobain Ceramics & Plastics, Inc (herein Crystar®).
2. As Product Manager I am in charge of technical marketing for Crystar® wafer boats and am very familiar with the wafer boat market.
3. Wafer boats in general, are sold to the semiconductor manufacturing industry where the buyer is usually a professional purchasing agent.
4. Wafer boats must meet exacting specifications to be able to function in extreme environments and are difficult to manufacture. Accordingly, the selling price is relatively high, e.g., approximately 30 to 40 thousand dollars each, compared to the other items typically bought by purchasing agents in the field.

5. Because of the wafer boat's high price and exacting specifications, the professional purchasing agents will exercise great care to purchase a wafer boat based on the best overall value, rather than just the lowest price. Moreover, one of the primary factors which influences the purchasing agent's decision to purchase, as well as the average selling price of a wafer boat, is the technology differences between wafer boats.

6. In addition to Crystar®, there are at least 3 major competitors and 3 minor competitors, which provide a competitive environment where the professional purchasing agent is free to choose on the basis of objective principles.

7. There are two major sub-markets in which the above competitors all actively compete on an approximately equal basis, i.e., the 200 mm wafer boat sub-market and the 300 mm wafer boat sub-market. Additionally, the overall competition for market share in both the 200 mm and 300 mm wafer boat sub-markets is approximately the same.

8. Crystar® introduced wafer boats sized to hold 300 mm silicon wafers, part number 990-0492, (herein Crystar® 300 mm Wafer Boats) to the market in approximately September 2001, which incorporated the invention defined in the claims of the Application, i.e.:

A wafer boat for supporting silicon wafers, the wafer boat comprising:
a ceramic body having at least one wafer support structure sized to support a silicon wafer thereon;

a ceramic coating disposed on a surface of the wafer support structure, the ceramic coating having an impurity migration preventing thickness that is substantially greater than or equal to 30 microns and a wafer contact surface, the wafer contact surface having a post coating surface finish;

wherein the post coating surface finish of the wafer contact surface substantially prevents frictional slip in the silicon wafers and is less than or substantially equal to 1.0 microns (herein the Invention).

9. Additionally, the same Crystar® 300 mm Wafer Boats also incorporated the following structural features:

- 1) arms having a horizontal upper surface portion and a rounded upper surface portion sloping downward from the horizontal upper surface portion; and
 - 2) arms which engage with the wafers at an innermost point of contact, which is in the region between 20% and 80% of the wafer radius (herein the enhanced geometric features).
10. The 300 mm wafer boats of the competition included all of the same functional features as the Crystar® 300 mm Wafer Boats except for the features of the claimed Invention of the Application and the enhanced geometric features.
11. Crystar® introduced wafer boats sized to hold 200 mm silicon wafers, part number 990-0536, (herein the Crystar® 200 mm Wafer Boats) to the market in approximately May 2001, which incorporated only the enhanced geometric features.
12. Other than their smaller size, the Crystar® 200 mm Wafer Boats had all of the same functional features of the Crystar® 300 mm Wafer Boats except for the claimed Invention of the Application.
13. The 200 mm wafer boats of the competition included all of the same functional features as the Crystar® 200 mm Wafer Boats except for the enhanced geometric features.

14. Upon introduction into the market, the Crystar® 300 mm Wafer Boats immediately gained market share. The average selling price of the Crystar® 300 mm Wafer Boats is approximately 2.4 times greater than the average selling price of 300 mm wafer boats of the competition. Additionally, the Crystar® 300 mm Wafer Boats have been successful in penetrating new foreign markets, specifically France, Taiwan and Japan.

15. Upon market introduction, the Crystar® 200 mm Wafer Boats also immediately gained market share. However, the average selling price of the Crystar® 200 mm Wafer Boats is only approximately 1.2 times greater than the average selling price of 200 mm wafer boats of the competition. This was a modest gain as compared to the 2.4 times increase in selling price of the Crystar® 300 mm Wafer Boats which included the claimed Invention. Additionally, the 200 mm Wafer Boats were not able to penetrate the French, Taiwanese or Japanese markets.

16. To the best of my knowledge, during the time Crystars® 200 mm and 300 mm Wafer Boats have been in the market, there have been no unusual increases in Crystars® marketing budget. Additionally, to the best of my knowledge, I know of no heavy promotion or advertising, shift in advertising, consumption by purchasers normally tied to the applicant or assignee, or other business events extraneous to the merits of the claimed invention relative to the Crystar® 200 mm and 300 mm Wafer Boats.

Richard R. Hengst Oct. 16, 2003
RICHARD R. HENGST

Sworn to and subscribed before me this 16 day of October, 2003.

My commission expires December 16, 2005

